Amendments to the Claims

This listing of claims will replace all prior versions and listings of the claims in the application:

Listing of Claims:

Claims 1-23 (canceled)

24. (currently amended) A system for determining the instantaneous amplitude (a) and phase (φ) of an analog sinusoidal signal comprising:

a vibratory accelerometer ~~sensor~~ which produces said analog sinusoidal signal output in response to the measurement of a parameter;

an analog-to-digital converter which receives said analog sinusoidal signal from the sensor and converts said analog sinusoidal signal to a digital sinusoidal signal to form the in-phase component (I) of said sinusoidal signal;

a Hilbert transformer approximation device which receives said digital sinusoidal signal and produces the quadrature component (Q) of said digital sinusoidal signal by introducing a phase shift to said digital sinusoidal signal; and

a Coordinate Rotation Digital Computer (CORDIC) comprising:

an amplitude computation device which receives said in-phase (I) and quadrature (Q) components and computes the instantaneous amplitude (a) of said digital sinusoidal signal by processing said in-phase (I) and quadrature (Q) components according to the equation $a = \sqrt{(Q^2 + I^2)}$; and

a phase computation device which receives said in-phase (I) and quadrature (Q) components and computes the instantaneous phase (φ) of said digital sinusoidal signal by processing said in-phase (I) and quadrature (Q) components according to the equation φ =

$\tan^{-1}(Q/I)$.

25. (original) The system of claim 24 wherein said Hilbert transformer approximation device further introduces a predetermined delay into said quadrature component (Q).

26. (original) The system of claim 25 further comprising a delay device which introduces said predetermined delay into said in-phase component (I).

Claims 27-35 (canceled)

36. (currently amended) A method of determining the amplitude (a) and phase (φ) of an analog sinusoidal signal comprising:

A. measuring a parameter of an object with a vibratory accelerometer ~~sensor~~;

B. generating said analog sinusoidal signal representative of said parameter;

C. digitizing said analog sinusoidal signal to produce a digital sinusoidal signal;

D. filtering said digital sinusoidal signal to attenuate out-of-band noise in said digital sinusoidal signal;

E. introducing a delay into said digital sinusoidal signal to produce an in-phase signal (I) associated with said digital sinusoidal signal;

F. performing a Hilbert transform approximation of said digital sinusoidal signal to introduce a phase shift plus the delay into said digital sinusoidal signal, thereby producing a quadrature signal (Q) associated with said digital sinusoidal signal;

G. processing, with a Coordinate Rotation Digital Computer (CORDIC), said in-phase (I) and quadrature (Q) signals to compute said amplitude (a) of said digital sinusoidal signal according to the equation $a = \sqrt{(Q^2 + I^2)}$; and

H. processing, with said CORDIC, said in-phase (I) and quadrature (Q) signals to compute said phase (φ) of said digital sinusoidal signal according to the equation $\varphi = \tan^{-1}(Q/I)$.

37. (Previously presented) The method of claim 36 wherein said vibratory sensor comprises one of an accelerometer, a gyroscope, and a microphone.

Claims 38-40 (canceled)

41. (Currently amended) A system for determining an instantaneous amplitude (a) and phase (φ) of an output analog sinusoidal signal comprising:

a vibratory accelerometer ~~sensor~~ which produces said output analog sinusoidal signal characterized by the instantaneous phase and amplitude in response to the measurement of a parameter;

an analog-to-digital converter which receives said output analog sinusoidal signal from the vibratory sensor and converts said output analog sinusoidal signal to a digital sinusoidal signal to form the in-phase component (I) of said sinusoidal signal;

a Hilbert transformer approximation device which receives said digital sinusoidal signal and produces the quadrature component (Q) of said digital sinusoidal signal by introducing a phase shift to said digital sinusoidal signal; and

a Coordinate Rotation Digital Computer (CORDIC) comprising:

an amplitude computation device which receives said in-phase (I) and quadrature (Q) components and computes the instantaneous amplitude (a) of said digital sinusoidal signal by processing said in-phase (I) and quadrature (Q) components according to the equation $a = \sqrt{(Q^2 + I^2)}$; and

a phase computation device which receives said in-phase (I) and quadrature (Q) components and computes the instantaneous phase (φ) of said digital sinusoidal signal by processing said in-phase (I) and quadrature (Q) components according to the equation $\varphi = \tan^{-1}(Q/I)$.

42. (Currently amended) A method of determining an amplitude (a) and phase (φ) of an

analog sinusoidal signal comprising:

A. measuring a parameter of an object with a vibratory accelerometer ~~sensor~~;

B. generating an output analog sinusoidal signal characterized by the instantaneous phase and amplitude representative of said parameter;

C. digitizing said output analog sinusoidal signal to produce a digital sinusoidal signal;

D. filtering said digital sinusoidal signal to attenuate out-of-band noise in said digital sinusoidal signal;

E. introducing a delay into said digital sinusoidal signal to produce an in-phase signal (I) associated with said digital sinusoidal signal;

F. performing a Hilbert transform approximation of said digital sinusoidal signal to introduce a phase shift plus the delay into said digital sinusoidal signal, thereby producing a quadrature signal (Q) associated with said digital sinusoidal signal;

G. processing, with a Coordinate Rotation Digital Computer (CORDIC), said in-phase (I) and quadrature (Q) signals to compute said amplitude (a) of said digital sinusoidal signal by applying the equation $a = \sqrt{(Q^2 + I^2)}$; and

H. processing said in-phase (I) and quadrature (Q) signals to compute said phase (φ) of said digital sinusoidal signal by applying the equation $\varphi = \tan^{-1}(Q/I)$.